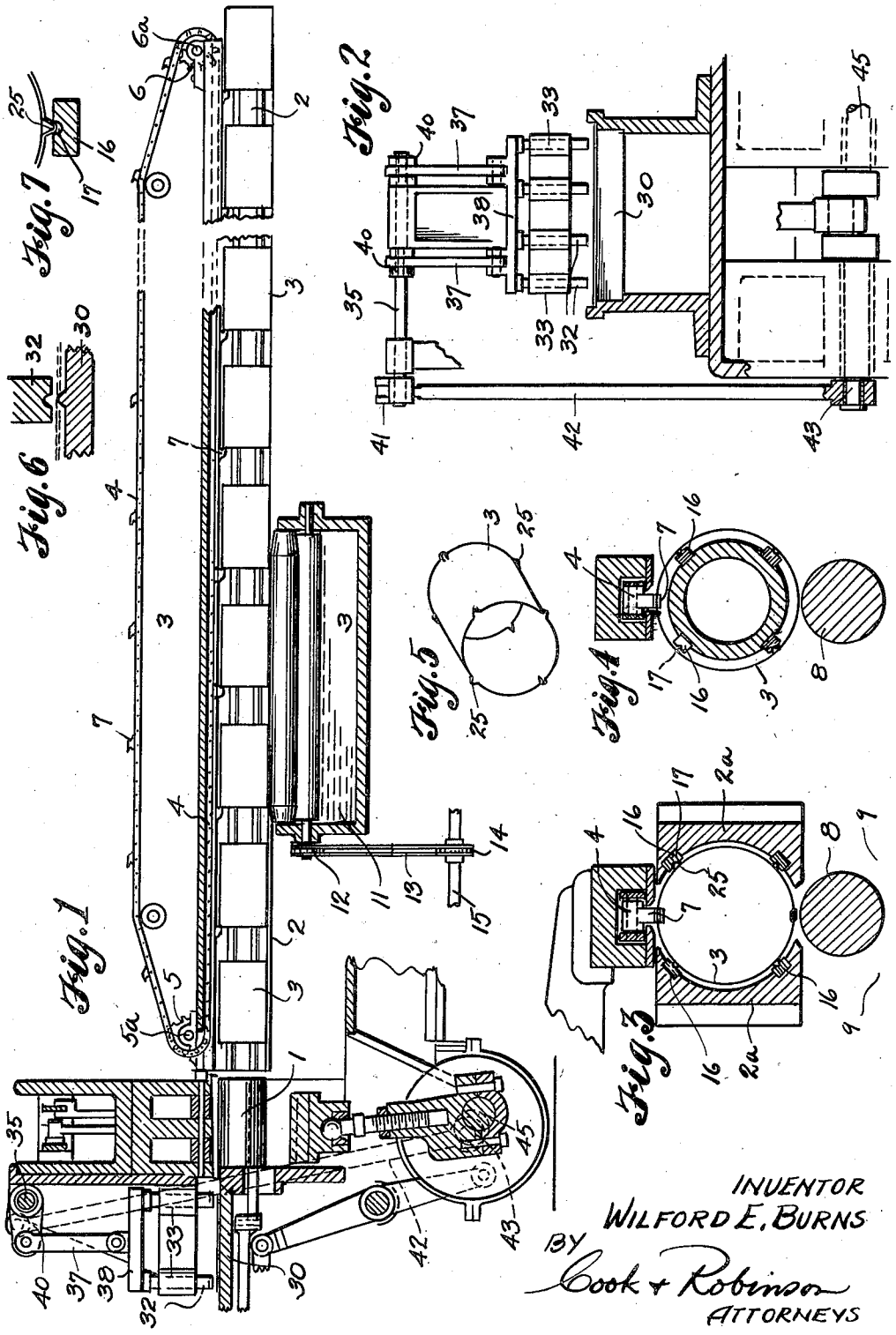
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CAN BODY FORMING MACHINE

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CAN BODY FORMING MACHINE

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This invention relates to can body manufacturing and it has reference more particularly to the provision of means for preventing scratching or marring the lithographed or enameled surface of can bodies during their process of manufacture and while being conveyed along the side seamer horn.

Explanatory to the invention it will here be stated that it is the usual procedure in the automatic manufacture of cans to advance the bodies from the forming machine along a horn to a soldering station for the application of molten solder to the side seams, from which station they continue in their travel along the horn through a cooling interval before being discharged. Due to the travel of the bodies along the horn, there is sometimes the objectionable result of scratching or marring the enameled or lithographed surfaces which bear in rubbing contact with the horn. An "outside" type of horn is in this respect objectionable for the manufacture of cans which are exteriorly lithographed. Likewise, an "inside" type of horn is objectionable to the manufacture of cans that are interiorly enameled. In the event that the cans being manufactured are both interiorly enameled and exteriorly lithographed, neither type of present day horns will entirely avoid the undesirable result of scratching or marring the surfaces of the body that it comes in contact with.

In view of the above, it has been the principal object of the present invention to overcome the possibility of these undesirable results by the provision of means whereby each of the can bodies will be formed at its ends, prior to its reaching the side seamer horn, with offset supporting bosses and to provide the horn with longitudinal guideways in which these bosses may travel, thereby to support the body surfaces free and clear of the horn structure as they travel therealong.

More specifically stated, the gist of the present invention resides in the provision of a means in a can body forming machine for automatically making the supporting bosses in the can bodies and in the provision of longitudinal, grooves guideways in the side seamer horn spaced to receive the offset bosses located at the ends of the can bodies, thereby to guide and support the bodies in their travel along the horn free and clear of surface contact with the horn structure.

It is also an object of the present invention to make provision in the body maker for forming the bosses in the can body blanks in those portions which later are incorporated in the end flanges to which the ends are seamed, so that in the finished can no effect of the formation of the bosses will be noticeable.

Still other objects of the invention reside in the details of construction and in the combination of parts as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing, wherein—

Fig. 1 is a sectional detail, in elevation, of a portion of a can body making machine embodying the present invention.

Fig. 2 is a vertical cross section illustrating the die punch actuating means.

Fig. 3 is an enlarged cross section of the "outside" horn and a can contained therein, as on the line 3—3 in Fig. 1.

Fig. 4 is a cross sectional view of a horn of the "inside" type equipped with the longitudinal guides.

Fig. 5 is a perspective view of a can having the supporting lugs formed at its ends.

Fig. 6 is a sectional detail of the die and punch.

Fig. 7 is a cross sectional detail of a horn guide.

It is to be understood that the present invention is applicable to the various types, or makes, of can body machines now generally in use and it is not intended that it be limited to any one in particular, nor is it to be confined to either the inside or the outside types of horns, since the different types of horns only require an opposite formation of the bosses on the can bodies; that is, one type of horn requires an inward formation of the bosses while the other requires an outward formation.

Referring more in detail to the drawing—

1 designates what may be the usual forming horn of a can body machine to which the flat body blanks are successively advanced and about which they are bent by the usual wing clamps to body form and their end hooks interlocked and bumped to join them in a permanent seam. The various devices whereby the blank edging, bending and seaming is done are not shown as the invention is not especially concerned with the details of these parts. However, the arrangement of parts that has been shown is substantially that of U. S. patents to Troyer, issued under No. 1,543,460 and No. 1,768,015.

Continuing from and in alinement with the horn 1 is the solder horn 2 into which the can bodies 3 are advanced for soldering. Extending

along the top of the horn is a continuous conveyor chain belt 4 operating about sprocket wheels 5 and 6 located at opposite ends of the horn. These sprockets have supporting shafts 5a and 6a, respectively, and one or the other is driven by suitable means, not shown, in proper synchronism with the body forming mechanism.

Fixed to the conveyer chain, at proper and regular intervals, are lugs, or pushers 7 whereby the can bodies are taken up as delivered from the mandrel and are advanced along the horn.

Underlying the horn and supported parallel therewith near its receiving end, is the solder applying roll 8 supported upon a pair of parallel rolls 9—9 with trunnions revolubly mounted in the end walls of a solder pot containing molten solder, designated at 11. The rolls 9 are revolubly driven by any suitable means, here shown to comprise sprocket wheels 12 fixed on end trunnions of rolls 9—9 and a driven sprocket chain 13 operating about the sprockets 12 and a sprocket 14 on a driven shaft 15. The can bodies are advanced along the horn with their side seams located at the under side of the horn, therefore they will be moved along the top side of the solder roll 8 whereby, in the usual manner, molten solder is applied to the seams.

As seen in Figs. 1 and 3, the horn 2, of the outside type comprises opposite side bars, 2a and 2a, in parallel relation and together forming a cylindrical passage between them for the passage of the can bodies. Each of the opposite side bars is provided interiorly with a plurality of longitudinally extending guide rails 16, equally spaced about the horn and provided in their inner surfaces with longitudinally extending grooves 17. In the present illustration, there are four of these rails spaced ninety degrees apart but it is to be understood that more or less might be employed and that the guides might be in the form illustrated or otherwise. Also, they might be grooves formed directly in the inner surfaces of the bars 2a.

Before the can bodies are delivered into the horn, they are provided at their opposite ends with outwardly formed bosses 25 of a character adapted to travel within the guide grooves of the rails 16 to serve as supports for the bodies to hold them in their travel free and clear of the horn structure as shown in detail in Fig. 7. These bosses are spaced about the can bodies in accordance with the spacing of the guideways in the horn and the latter are so located that as the cans are advanced to the horn, the bosses will enter the grooves of the several rails. Also, the bosses are so designed that they will support the outer surfaces of the bodies at a spaced distance from the horn surfaces so that there will be no rubbing contact that could mar the can body surface. The bosses 25 are formed in the extreme end portions of the bodies and in those portions which later are incorporated in the body flanges and therefore they do not damage any exposed area of the finished can.

The means whereby the bosses may be formed in the can bodies may be of various kinds. In the present illustration, I have provided a die 30 which, as seen in Fig. 2, is fixed between the folder housings 31—31 in advance of the horn 1 and across which the body blanks are advanced. Located above the die are punches 32 vertically slidable in guides 33 and adapted to be actuated downwardly against the blanks by the action of a rock 35 which is oscillated in timing with the blank feeding devices, not shown, but which might be of the reciprocating type of the Troyer patent first mentioned. The connection, as here shown, comprises a pair of connecting links 37 having ends pivotally attached to a block 38 that mounts the several punches, and their other ends pivotally connected to lever arms 40 on the rock shaft. At one end of the rock shaft is a lever arm 41 connected by a link 42 with an eccentric 43 on the end of a driven crank shaft 45, revolubly mounted in the arch of the body maker. The timing of operations is such that the punches operate on the blanks during their period of rest they coact with the die to form the bosses at the blank edges.

When the horn used is of the outside type as seen in Fig. 3 the bosses should be formed outwardly on the body. When an inside horn, as in Fig. 4, is employed, the bosses are formed inwardly, thus to engage the guides 16 thereon as seen in Fig. 4. This latter formation of the bosses can readily be accomplished by a reversal of the dies and punches, which is obvious.

With the bodies properly provided with supporting bosses of the character shown, and with the horn provided with means to receive the bosses, it is apparent that the body surfaces can be supported free of contact with the horn and no damage will result to the enameled or lithographed surfaces thereof by reason of travel of the bodies along the horn.

As an additional value, the bosses act as guides whereby the side seams of the bodies are held properly in line for solder application and pushers of a simple type may be used on the conveyer chain.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters-Patent is—

1. In a machine for forming can bodies, a body forming mechanism, a soldering horn of different diameter than that of formed bodies, means for conveying formed bodies from the forming mechanism along the horn, and means operable to form each body with offset bosses prior to its delivery to the horn and whereby, when moved along the horn, the main body portion thereof will be supported from surface contact with the horn in its travel therealong.

2. In a can body making machine, a body forming mechanism, a soldering horn, means for conveying formed bodies along the horn, means operable to form each of the bodies, prior to its delivery to the horn, with a plurality of bosses offset from the body; said horn having guideways longitudinally thereof arranged to receive the said bosses therein and of lesser depth than the offset distance of the bosses thereby to support the main portions of the bodies free of surface contact with the horn structure in their conveyance along the horn.

3. In a can body forming machine, means for forming body blanks into bodies, a soldering horn, a conveyer for moving formed bodies along the horn, devices operable to form the body blanks with offset bosses at the top and bottom edges thereof; said horn having guideways longitudinally thereof and of lesser depth than the distance of offset of the bosses and adapted to receive said bosses thereby to support all other body surfaces free of the horn structure.

4. In a can body forming machine, in combination, a horn, a conveyer whereby can bodies are moved along the horn; said horn having a plurality of rails longitudinally thereof spaced about the horn and longitudinally channeled to

uniform depth; said can bodies being provided at their opposite ends with offset bosses of greater extent than the depth of channeling of said rails and spaced in accordance with the spacing of said rails about the horn and adapted to track within the grooves of the said rails thereby to support the main portions of the bodies free of surface contact with the horn in their travel therealong.

5. In a can body machine, the combination with devices whereby can body blanks are formed into bodies, of means operable on the body blanks prior to their being shaped to body form, to form each with a plurality of offset bosses at its ends, a conveyer, and a horn having longitudinal channeled guideways of lesser depth than the extent of offset of the bosses adapted to receive the said bosses of the bodies when conveyed therealong by the conveyer, thereby to support all other parts than the bosses free of surface contact with the horn.

6. Can body manufacturing means including means for forming body blanks into tubular bodies, a soldering horn, means for conveying formed bodies along the horn, and means whereby each body is formed with a plurality of offset bosses adapted for supporting contact with the horn as a means of supporting the main portions of the formed bodies from surface contact with the horn while conveyed therealong.

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